

**SFWMD**

**Water Supply Contingency Plan**

**Attachment II –**

**Comments Received on Draft Plan  
Released August 25, 2000**

**October 10, 2000**

**South Florida Water Management  
District**

**Water Supply Division**

TO: Jose Calas

FROM: Herbert H. Zebuth

DATE: August 23, 2000

SUBJECT: SFWMD's Lake Okeechobee Water Supply Management Options

COPIES: Melissa Meeker

1. Use WCA-1 as storage system

***This proposal would add water to WCA-1 up to its regulation schedule instead of discharging to tide from Lake Okeechobee if late season rains drive the lake level above regulation schedule. Water could then flow by gravity back into the lake as required.***

Primary consideration must be given to requirements of the settlement agreement and STA treatment capacity. As long as the regulation schedule of WCA-1 was not exceeded and water quality was adequate, environmental impacts should be minor. Water from the WCA-1 may vary in quality depending upon its source within WCA-1. Water in the boundary canal came primarily from the S-5A Pump Station and would be of the poorest quality within the WCA. After being contained within the WCA for a period of time settling and biological activity should have improved its quality to some degree. Water drained from the marsh after the canal is lowered would be of a much better quality.

I think an important consideration would be to ensure that water is moved slowly (small CFS) so as to disturb bottom sediments within all the canals as little as possible. Past experience has shown that water quality will deteriorate as sediments are disturbed. Water quality monitoring should occur and in sufficient intensity to allow us to accurately analysis the consequences of this action. It would be useful to be able to determine if and where within the canal system pollutant enter the flow.

An area that could be investigated as an additional source of water would be the Corbett Wildlife Management Area and the Dupuis Preserve. Water quality samples that were taken last winter from ditches draining these two areas contained phosphorus levels of about 25 ppb. Two agricultural discharges into the L-8 Canal near the lake do present water quality concerns (about 226 ppb P). During a drought, coordination between any drainage discharges from these sources and movement of water back into the lake to prevent avoidable phosphorus loading should be possible and should be required.

I'm uncertain of the quantity of water currently contained in those areas. Little may be available. Flows are controlled by culverts discharging into the L-8 Canal near the lake. Managers of the Corbett have complained for several years of excessively high water

levels. It would probably be some of the best quality water in the basin to raise lake levels during this drought if it were available.

2. Lower lake level initiation of supply side management plan.

***This proposal would allow the lake to fall 0.5 foot below the currently established level at which water conservation measures (supply side management) are required in the EAA and other agricultural areas near the lake.***

This proposal has implications regarding Minimum Flows and Levels for the lake. Current Supply Side Management Plan requirements institute conservation measures when the lake reaches 11 feet NGVD. Under this proposal, lake levels would be allowed to drop to 10.5 feet NGVD before such measures were instituted. A current proposal for the MFL for the lake is 11.0 feet NGVD except for a brief drop to 10.5 feet NGVD at the end of the dry season. What are the long-term implications for this MFL if this proposal is implemented?

3. Identify trigger levels for declaring water restrictions for east coast utilities – especially those isolated from regional supply, east of salinity control structures.

***Apparently groundwater levels to trigger water supply restrictions would be established for utilities isolated from supply by the regional system and east of salinity control structures that would differ from the current levels.***

Since lake levels and even regional groundwater levels have little effect upon the ability of these utilities to withdraw water from the aquifer, it seems logical to establish local groundwater withdrawal levels which pose a threat of damaging saltwater intrusion.

4. Identify for all discharge locations, water elevations at which pump and gravity flow will no longer pass from the lake into WMD canals and determine availability and cost for auxiliary pumps.

***Withdrawal of water from the lake has been limited by the physical flow constraints of culvert and pump intake pipe bottom elevations.***

Until now, the lake has been protected from unlimited withdrawals by these physical constraints on withdrawals. If auxiliary pumps are used, it will be easier to damage the lake through excessive low levels than to impose water restrictions, or in the future to limit water use permit amounts, or require reuse or alternative source development. Agricultural demands are actually increasing substantially in the lake's service area, especially in the Caloosahatchee Basin and northwest of the lake where extensive sugarcane plantings are planned. Once this precedent is established, it will very probably be continuing and permanent. Although the current crisis revolves around high lake levels, future urban and agricultural water supply demand projections will cause low water impacts to be the major concern. Lake ASR, which is the CERP protection for the lake will not be fully on line for 20 years at best. Protection from low water impacts of the lake's fish, wildlife and other ecological values will be more difficult. Proposed lake MFL levels have no actual annual low limit. Its MFL will be met unless levels fall below 11 feet **for more than 80 days more often than once every 6 years**

(on average). There are enough caveats in the proposal to make the number of 11 feet almost meaningless. In simplest terms, the lake can be drawn down to an unlimited low level but no oftener than one every 7 years (on average).

5. Include in contingency plan, crop types and cycling, and water needs and its timing.

***Since agricultural water supply, especially in the EAA is the biggest demand on the lake, crop type, planting time, rotation and water need are important in projecting water needed at any given time.***

This is a logical necessity to be able to determine water quantities needed through the year. It should also be used to determine the acreage that can be supported during a drought and no water use commitments made above a quantity that will cause environmental harm. Instead of using water available during normal rainfall years, drought demands should play a more important role in determining the issuance of water use permits.

6. Instead of maintaining normal canal levels upstream of salinity control structures, only release water from the regional system to maintain levels proposed for MFLs for each canal.

***Each WMD Canal has a /eve/ at which it is maintained. This /eve/ is listed in the system operational manual. In most cases, the proposed MFL for these canals are lower than the normal operating /eve/. Water would be kept in the regional storage system by allowing canal stages to decline to the proposed MFL for each canal.***

Coastal canal MFLs do allow some additional migration of saltwater into the aquifer. A MFL is determined by its ability to maintain the normal eastward movement of groundwater at wellfields, not by its ability for prevent westward intrusion of saltwater. Current wellfield locations seem to be the only consideration. This proposal should be analyzed for its impact upon the entire freshwater aquifer.

7. Use temporary structures such as bladder bags to serve as canal level controls to maximize retention and use of available water.

***Control structures on regional canals have not been located to maximize water retention but for drainage efficiency. Often control structures are located in the lowest areas with control levels set to protect these low areas from flooding. Often higher areas along the canal length are over-drained such (such as Jupiter Farms and along the western length of the C-51 Canal). Temporary structures placed in canals to allow higher groundwater elevations to be maintained in areas of higher ground elevation would increase groundwater storage and conserve water currently lost to tide while allowing easy removal or adjustment for flood control needs.***

Most recently, proposals to accomplish this result have been recommended by the Governor's Commission for a Sustainable South Florida and the CERP Restudy Team.

It has been an obvious need for decades and should be made a permanent feature of the system until the CERP is fully implemented.

8. Discuss water conservation plans with urban 298 Drainage Districts including holding water levels higher, conserving region system discharges, and control of gravity inflows to major canal systems. Coordinate regional releases with 298 district withdrawals.

***Since regional system discharges may be necessary because of localized conditions, other areas should be prepared to make use of this water that would otherwise be lost to tide, to recharge their groundwater. Specific opportunities would exist in the C-57 and Hillsboro Canals and Lake Osborne. These opportunities would specifically apply to the Lake Worth Drainage District that normally recharges its canals by making withdrawals from WCA-1.***

This is another logical action that should become standard operating practice.

9. Determine the possibility of drawing down the chain of lakes in Osceola and Polk Counties to increase water levels and water supply in Lake Okeechobee. Coordinate drawdown schedules with FFWCC and other agencies.

***All lakes that are part of the Regional system are operated according to individual regulation schedules. An investigation will be made to determine if water levels in these lakes can be reduced below their regulation schedules to increase levels in Lake Okeechobee and increase agricultural and urban water supply. Occasionally, lakes are drawn-down to allow accumulated muck to be removed and improve ecological health. Coordinate a potential drawdown with any interest of the FFWCC to conduct such activity.***

This proposal should be analyzed for its environmental impacts and the precedent it might set for reducing environmental protection for natural areas and encouraging expanded demands on the natural system instead of development of reuse and alternative supplies.

10. Expand SFWMD WEB page to inform the public about drought conditions and actions to expand the water supply.

***This option is self-explanatory.***

Distribution of public information is good and should be used to encourage water conservation, which has not yet occurred on a general basis.

11. Provide water to the Brighton Reservation with Pump Stations 207 & 208 and with pulse releases from Lake Istapoga.

***Backpump water from Lake Okeechobee northwest to the Brighton Seminole Reservation and provide water through the C-40 and C-47 Canals by pulse releases from Lake Istapoga.***

Pump Stations 207 & 208 backpump water from Lake Okeechobee over the S-71 and S-72 Structures in the C-40 and C-41 Canals to supply water during droughts to the Brighton Seminole Indian Reservation and the agricultural interests in those basins. Water for the Reservations is most likely covered under the Seminole Indian Water Compact. Agricultural activities are expanding in this basin which has limited water resources.

12. Investigate operational flexibility within the C-I 39 Basin and use of pumps 406 & 409 to transfer water to the L-3 Canal.

***Pump water from the EAA (Miami Canal, L-2, 3 and 4 Borrow Canals) west into the Seminole Indian Reservation in the L-28 Basin and to agricultural interests in the C-139 Basin.***

Pump Stations 406 and 409 are new facilities located in the L-4 Borrow Canal and the L-312 Borrow Canals which provide the flexibility to move water either to the overdrained northwest corner of WCA-3 or further west into the Seminole Indian Reservation in the L-28 Basin and to agricultural interests in the C-139 Basin. During droughts, local rainfall in the western EAA that might require flood control discharges to the WCA-3 could be transferred to the other two basins for water supply, if needed. A rainfall driven delivery schedule for WCA-3 is to be developed in the future which will naturally decrease water releases to the area during droughts. Caution should be observed to ensure that adequate water is still provided to the natural areas in WCA-3 and that over-drainage is not intensified during droughts. A precaution would be to ensure that such a schedule is not altered during drought conditions, This would be a true example of shared adversity.

13. Investigate pumping water from the Hillsboro Canal through the C-5 Canal into the C-2 Canal; recharge Prospect Lake from the C-14 Canal; and investigate Hollywood recharge options.

***Provide water for recharge of Broward County wetlands by pumping water from the Hillsboro Canal through the C-5 Canal into the C-2 Canal; recharge Prospect Lake from the C-14 Canal and investigate Hollywood wetland recharge options.***

This proposed aquifer recharge project supports the "Broward County Secondary Canal Recharge" alternative recommended in the most recent draft of the SFWMD's LEC Water Supply Plan and is included in the CERP. Excess runoff from the Hillsboro Basin, North New River, C-14, and C-I 3 canals would be diverted via pump stations into the network of interconnected lakes and secondary canals in northern Broward County. Benefits of that alternative include reducing water lost to tide, maintaining higher water levels, improving recharge of the Biscayne aquifer, and reducing the threat of saltwater intrusion. A recommendation to reclassify Prospect Lake from Class 1 to Class 3 to allow its connection to the Palm Aire Canal was made by the Tallahassee Water Facilities Section in May 2000. If this reclassification has not yet occurred, connection cannot take place until Prospect Lake is reclassified from Class I to Class III waters.

14. Dade County, drop coastal canal controls 1/2 foot during the dry season.

***Lower the Dade County coastal canal water control elevation by 12 foot during the dry season; cut back deliveries to south Dade; increase ASR/Florida Aquifer blending at Alexander Orr we//field; and shift Hialeah/Preston to 60 MGD maximum withdrawal.***

If this proposal refers only to the water elevation at which regional system deliveries are required to be made to the coastal canal system, additional groundwater storage capacity would be available to prevent the discharge of local rainfall to tide. If control structure discharge elevations are lowered 12 foot, no additional storage capacity would be added, flows to tide would not be reduced, less fresh groundwater would enter coastal wetlands, and effects on the salinity intrusion line could be negative. Even the first possible operational scenario could have similar but less dramatic effects upon the coastal wetlands and saltwater intrusion line. Due to hurricane preparations, I was unable to contact any SFWMD staff to clarify the intent of this proposal, although the former certainly seems more logical.

Blending of water and shifting of production should be guided by the need to maintain drinking water quality standards.

15. Coordinate WCA-2A drawdown schedule with water supply/environmental needs.

***As the regulation schedule for WCA-2A declines and water is required to be discharged, coordinate releases so discharged water can be utilized for water supply or storage at other locations or used for necessary environmental benefits.***

During the winter and spring the regulation schedule for WCA-2 declines until it reaches its low point on May 31st. If water is required to be discharged from WCA-2 for4 this reason, coordination should occur with others to ensure the water is not wasted to tide but used for water supply, transferred to other available storage, or used to satisfy necessary environmental demands. SFWMD responsible staff I was able to contact was unsure of the exact meaning of this proposal. Due to hurricane preparations, I was unable to contact SFWMD lead person to clarify the intent of this proposal, although my interpretation certainly seems the logical application. If used in this manner, it should be beneficial in all respects.

16. Investigate the application of a bubble curtain west of S-79 lock.

***Consider placement of a bubble curtain in the Caloosahatchee River downstream of the last (S-79) lock to reduce the saltwater wedge moving up the river; reduce the number of lock openings to conserve freshwater; and evaluate the effectiveness of lower cfs than standard freshwater releases to the river to control river salinity.***

A bubble curtain is being considered which could mix the saltwater wedge as it moves up river with freshwater flowing above the wedge to dilute the saltwater and lower the total dissolved solids concentration reaching the drinking water intake. This could also

benefit the freshwater eelgrass beds for the same reason if placed down stream of their location. If used for any extended period of time, caution should be used until it is determined that the bubble curtain will not interfere with the migration of larval species that are born in the freshwater portion of the river but must migrate to the estuary during that portion of their life cycle. A bubble curtain might prevent their passage and could trap them, allow numbers to buildup and expose them to increased predation pressure.

Locks are usually opened on demand to serve one boat or a number of boats. Opening Lock S-79 results in the discharge of freshwater to tide. Scheduling lock opening such as on the hour could allow a number of boats to gather and jointly use the lock thus reducing the total number of openings and saving freshwater. It seems a reasonable sacrifice to ask of boaters during a drought when water use restrictions could hang in the balance.

It would be logical to determine the flow volume necessary for adequate salinity control in the river and to restrict flows during droughts to the minimum necessary

17. Lee County utilities should transition to liquid chlorine or equivalent to reduce salt discharged to river.

***Lee County Utilities should change its disinfection technique from a solid chlorine compound to liquid chlorine or the equivalent.***

Lee County Utilities apparently uses a solid chlorine compound for disinfection of raw drinking water. This compound results in the production of dissolved solids as a byproduct, which is discharge to the river increasing the salinity problem in the river at the plant. This seems like a logical suggestion and would be allowable if drinking water standards were maintained.

18. Review the possible effectiveness of cloud seeding to supplement low rainfall.

***Determine the effectiveness of cloud seeding to increase rainfall.***

Cloud seeding was investigated by the SFWMD and used experimentally during the 1982-83 drought. It did not appear to be effective at that time. Possible advancement in the technique may have occurred since that time. I am not aware that the Department regulates materials used in the process.

19. S-47 A-D operations-coordinate the implementation of water shortage delivery protocols with water users in the C-19 Basin.

***Coordinate the operation of the S-47 B and D Structures with water users in the C-19 Basin.***

S-47 B and D control water releases from the lake to the C-19 Basin and from the C-19 Basin to the Caloosahatchee. Coordination of the operation of these structures with the basin users to maximize the efficiency of this operation could save water and seems logical under drought conditions.



20. Lake Okeechobee backpumping for water supply.

***Backpump any agricultural drainage triggered by local rainfall into Lake Okeechobee instead of the STAs or WCAs.***

During the dry season, local rainfall is seldom large enough to raise SFWMD Canal stages to the level that would trigger flood control backpumping into Lake Okeechobee. All drainage would be pumped to the STAs or into the WCAs. Additional water could be added to the lake and available for later EAA irrigation if this drainage water was backpumped into the lake. In the past, water supply backpumping has resulted in the poorest quality water discharged to the lake from the EAA.

During dry periods, bacterial oxidation of the muck soil produces soluble by-products that are flushed from the soils in higher concentrations due to the less frequent rainfall events. Canals are usually low and pump operation scours the canals resulting in the discharge of turbid, nutrient rich, polluted water into the lake. These discharges are very high in nitrogen, add additional phosphorus, and are low in dissolved oxygen and high in dissolved solids. Other pollutants are also present including dissolved organic material that has significantly increased Trihalomethane concentrations in drinking water from the lakeside water treatment plants. This practice has all but disappeared since the latter part of the 1980s due to a conscious decision the impacts to the lake were too severe. During water supply backpumping in 1981, 300,000 acre feet of water was discharged into the lake. Water quality in the lake 7 miles northwest of the S-2 Pump Station and 5 miles north of the S-3 Pump Station has virtually the same water quality as the pump stations' discharge.

According to the SFWMD Lake Okeechobee Operation Permit and the included Interim Action Plan (IAP) currently in affect, water supply backpumping is not authorized. In accordance with Permit 50-0679349, Specific Condition No. IIB, the SFWMD Board must notify the Secretary that they are suspending the IAP before any water supply backpumping can occur. Within seven days written justification must be given to the Secretary. Nutrient loading amounts are included in the yearly total and are subject to the specific limits included in the permit for both nitrogen and phosphorus at the S-2 and S-3 Pump Stations. The possibility of a permit violation for nutrient loading exists. The Department should take a strong against this proposed action.

21. Investigate backpumping in the wet season (early) and the ecological effects on Lake Okeechobee.

***Continue water supply backpumping into the beginning of next wet season.***

See comments for Option 20 and 22.

22. Evaluate the effects of turbidity and phosphorus on SAV by location of backpumping.

***Determine if turbidity and phosphorus backpumped into the lake will affect submerged aquatic vegetation.***

See comments for Option 20. The IAP was specifically included in the SFWMD Lake Okeechobee Operating Permit because backpumping was determined to be an unacceptable pollution source and detrimental to the ecological health of the lake. SFWMD staff determined in 1983, that recent backpumping at that time, may have been responsible for a heavy bloom in the south end of the lake of the blue-green algae *Anacystis*. Currently, some of the best stands of remaining submerged aquatic vegetation are in the south end of the lake. Algal blooms and the turbidity they cause has been sighted as a major cause of the recent decline of this important plant community.

23. Determine the feasibility of using S-2 and S-3 for pumping in reverse direction for backpumping into Lake Okeechobee.

***I am uncertain of the meaning of “pumping in reverse direction for backpumping”. I could not contact any appropriate SFWMD staff for clarification due to the preparations for the approaching hurricane.***

See comments under Options 20 and 22.

24. Determine whether water can be withheld from the STAs if the District is in a water shortage more severe than Phase 2 restrictions.

***Current/y, STAs must be provided water to maintain 6 inch of standing water to retain aquatic vegetation used for treatment and to prevent soil oxidation that could contribute to water quality problems when the STA was refilled.***

Obviously there is a question as to the legality of this option since the settlement agreement requires the maintenance of STAs as does the Everglades Forever Act.

25. Consider project culvert improvements throughout the SFWMD system and within 298 Districts.

***I am uncertain of the exact meaning of “culvert improvements”. I could not contact any appropriate SFWMD staff for clarification due to the preparations for the approaching hurricane.***

Any modifications to SFWMD or 298 District culverts would require permitting before construction activity could begin. Full understanding of the implications of such modifications would be necessary.

26. Consider regulatory requirements for contingency options and coordinate with DEP and other agencies.

***Determine if proposed options are permissible or offensive to other agencies.***

Permitability must obviously be considered. I am unaware of the occurrence of any coordination activities with this agency regarding this question to date. Future action may be planned after the threat of the hurricane passes.

# FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION



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September 15, 2000

Mr. Frank R. Finch, P.E.  
Executive Director  
South Florida Water management District  
P.O. Box 24680  
West Palm Beach, Florida 334164680

Re: Draft Water Supply Contingency Plan,  
Multiple Counties

Dear Mr. Finch:

The Office of Environmental Services of the Florida Fish and Wildlife Conservation Commission has reviewed the referenced document, and provides the following comments.

## Background

The draft Water Supply Contingency Plan, dated 29 August 2000, outlines 24 operational options for **dealing** with what is anticipated to be an extreme drought during **the** upcoming dry season. **These** options range from actions that **could** be taken in the Kissimmee basin, Lake Okeechobee, **the** Water Conservation Areas, the Lower East Coast Region, and the Lower West Coast Region. One of the options, moving water from Water Conservation Area 1 to Lake Okeechobee, has been **in** operation since 15 August 2000; and another, pumping water out of Lake Okeechobee through the S-351, S-352, and S-354 structures, was just approved at the 13 September Governing **Board** meeting.

## Concerns

Most of the proposed actions are not likely to have a direct impact on fish and wildlife resources; however, two of the options do have a real likelihood of harming fish and wildlife habitat, and consequently are of serious concern to us. **In** addition, we note that there are no water-conservation options proposed for any of the areas except for the Lower West Coast Region, and urge the South Florida Water Management District to examine the possibility of including this type of option for the Kissimmee region, **Lake** Okeechobee Service Area, Lower East Coast Region, and the Florida Keys.

Backpumping into Lake Okeechobee. The plan proposes to begin during the wet season to backpump up to 300,000 acre-feet into Lake Okeechobee for water supply needs. We are very pleased that the Governing Board voted recently against test backpumping from the S-2 and S-3 structures, instead opting to investigate potential impacts via lab analyses. This was a sound decision, given the very real possibility of incurring damage due to poor water quality. Nevertheless, we remain concerned about the conditions under which backpumping could still occur.

Backpumping from the Everglades Agricultural Area into Lake Okeechobee has a well-documented track record of having caused problems related to water quality. Some of the potential effects include phytoplankton blooms and enhanced growth of filamentous algae on newly recovering submerged aquatic vegetation. Increased sedimentation could result in lowered concentrations of dissolved oxygen if turbidity increases sufficiently to reduce photosynthesis. Suspended sediments can also cover submerged aquatic vegetation, thereby negating some of the recently observed benefits from the lowered lake stages; and, once settled out of the water column, these sediments can physically change the lake bottom causing a shift in benthic invertebrate populations. A shift from the amphipods and midges that support the lake ecosystem to less desirable segmented worms was observed when the "298" districts were allowed to backpump in the 1980s.

In addition, we question the efficacy of shifting water storage from canals, which have a relatively small surface subject to evapotranspiration, to a large body of surface water such as Lake Okeechobee, which has a potentially high rate of evaporation and transpiration. Since roughly 66% of the water that leaves the lake can be through evapotranspiration, we believe that backpumping must be carefully examined to determine if it is sufficiently effective to warrant the harm that it would cause.


At the September Governing Board meeting, it was declared that backpumping would be considered as a last resort. We are not sure how "last resort" conditions will be determined or defined. Because of the adverse effects of backpumping, we recommend that backpumping into Lake Okeechobee be deleted as a water supply option.

Deviation in the Regulation Schedule of Water Conservation Area 2A (WCA-2A) One of the plan options is to continue the deviation from the normal regulation schedule for WCA-2A (and, by extension, WCA-2B). This deviation, which has been in place for the past several years to address concerns about the endangered Cape Sable seaside sparrow, allows up to 3.5 extra feet of water to be stored in this area, specifically during the dry season, when shallow marshes should be drying out. Although it might be tempting to rationalize this option by declaring that WCA-2A has already suffered harm from muck fires and previous high-water events, we cannot **support** continuing to treat it as a surge tank. One of the key tenets of Everglades restoration is that large spatial extent is a defining characteristic of this system, and the loss of half of its historic extent makes remaining areas that much more important to restore and maintain.

Mr. Frank R. Finch, P.E.  
September 15, 2000  
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In addition to having concerns about long-term consequences, we are also concerned about more immediate potential impacts to wading birds. The greatest deviation currently occurs from November to late February, but remains substantial even into May. This interval coincides with the nesting period for wading birds. We are concerned that holding water so deep in WCA-2 during this critical time would preclude the use of this area for foraging. The fact that WCA-2 lies well within the foraging radius of the largest rookery remaining in WCA-3A makes this deviation of particularly worrisome. Unless foraging conditions are excellent in WCA-3A, we are concerned that holding excessively deep water in WCA-2 at this time of year would result in an unnecessary increase in nest failure due to lack of sufficient prey availability.

Sincerely,

  
**Bradley J. Hartman**, Director  
Office of Environmental Services

**BJH/MAP**

ENV 2-16/9

ENV 2-18/1

WSCPI.ltr.wpd

cc: Ms. **Terrie** Bates, SFWMD, West Palm Beach  
Mr. Dean Powell, SFWMD, West Palm Beach

# AUDUBON OF FLORIDA

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SEP 19 2000

September 15, 2000

Water Supply Department

Mr. Dean **Powell**  
South Florida Water Management District  
3301 Gun Club Road  
West Palm Beach, Florida 33406

Re: Water Supply Contingency Plan

Dear Mr. Powell,

The following are Audubon of Florida's comments on the August 25, 2000 Draft Water Supply Contingency Plan. We commend the South Florida Water Management District for its attempts to address this dry season's anticipated water shortages in a proactive manner. Audubon recognizes that water shortages place stresses on both human and environmental users. Likewise, competition for water resources during times of scarcity has the potential to exacerbate these stresses. We are impressed that throughout the document, staff presents a generally balanced commentary, providing background on the pros and cons of each option considered. The following pages contain comments on specific issues.

Given the urgency of this situation and the pace of the plan's generation, there will likely be unanticipated consequences. Enhanced monitoring of natural areas should be an integral component of this plan, and should be implemented concurrently with any/all of the options presented. This information will help protect the natural system from irreparable harm. Furthermore, it will help us to identify and quantify damage that will be experienced by the natural system due to this year's planned activities, and it will assist us in planning and conducting efforts to reverse whatever damage is observed.

Recognizing that subjecting the natural system to the stresses associated with this plan during successive years has the potential to cause significant and/or serious harm, this contingency plan should remain in effect for a maximum of one year. A concerted effort should be made to avoid implementation of many of these options for a second year.

It is our opinion that one issue appears to have been inadequately addressed. Specific measures that would extend adversity to include another large user of water from Lake Okeechobee, the Everglades Agricultural Area, were not included in the plan. If the Plan



can examine detailed water conservation measures for relatively small water users (Options #20 and 21-change sprinkler heads, reduce day-time irrigation, install rain switches, and so on), why did this report omit specific water conservation measures that water users in the Everglades Agricultural Area should implement? On-site water storage, reduced irrigation, and other measures on these lands have a major impact on water use, yet were omitted. Indeed, Option #7 discusses weakening water conservation measures, however, this seems contrary to the entire purpose of this document.

Lastly, Audubon commends the Governing Board of the South Florida Water Management District for declining to move forward with the proposal to **backpump** water from the Everglades Agricultural Area to Lake Okeechobee. We were quite distressed, and somewhat shocked, that this extremely controversial measure came to the Board prior to the September 15 deadline for public comment on the Draft plan. Action prior to the receipt of requested public input could give the appearance that the SFWMD does not care to receive or consider concerns from the public.

Thank you for receiving these comments. As always, Audubon stands ready to assist the SFWMD in dealing with the difficulty of rationing water resources during dry-periods and/or periods of drought. The following comments are related to specific options presented in the Draft Water Supply Contingency Plan.

#### **Option #2. Allow Deviation from the Water Conservation Area 1 Schedule**

The existing floor of the Water Conservation Area 1 regulation schedule is 14 feet. By decreasing the floor to 11 feet, the risk of drought-related impacts, including impacts to fish and wildlife, and native vegetation are increased. The duration of the proposed deviation is not specified in the draft plan. Furthermore, a recovery strategy that would address “reversing” the impacts of the deviation is not present in the draft plan. Both aspects would be crucial to determining what type and degree of damage will occur in the Arthur R. Marshall Loxahatchee National Wildlife Refuge, and what level of effort will be required to provide recovery from identified impacts.

For example, enhanced environmental monitoring would seem to be prudent during the implementation of the deviation to evaluate the need for increased exotic species control. Likewise, intensified exotic species control efforts might be required if the proposed option results in drier conditions and/or fires that exacerbate in the expansion of exotic species.

Due to the potential for this option to cause significant or even serious harm (if repeated in successive years), this option should not be exercised until other options, including water restrictions, have been implemented. As stated in the draft document, this option might result in the violation of the proposed Everglades MFL. Due to this link, it seems logical that this option should not be exercised until Phase III water restrictions are implemented (a common threshold with MFL violations).

#### **Option #4. Kissimmee Chain of Lakes Operational Flexibility**

This option is reasonable. Lower water levels in the Chain of Lakes can provide “drawdown” benefits and help keep these lakes healthier. Keeping water flowing through the Kissimmee River will provide environmental benefits as well, especially in the recently restored area.

#### **Option #5. Allow Deviation from the Water Conservation Area 2A Schedule to Provide Additional Storage**

The duration of the proposed deviation is not specified in the draft plan. Furthermore, a recovery strategy that would address “reversing” the impacts of the deviation is not present in the draft plan. Both aspects would be crucial to determining what type and degree of damage will occur WCA 2A, and what level of effort will be required to provide recovery from identified impacts.

Enhanced environmental monitoring seems to be prudent if this option is to be implemented due to the potential for this option to cause significant or even serious (if repeated in successive years) harm. This option should not be exercised until other options, including water restrictions, have been implemented. As stated in the draft document, this option might result in adverse environmental impacts due to prolonged high water, or due to prolonged low water (if the minimum threshold is relaxed) in exchange for an undetermined water supply benefit. As with Option #2, it seems logical that this option should not be exercised until Phase III water restrictions are implemented.

#### **Option #7. Develop and Implement a Modified Supply Side Management Plan**

The Supply Side Management Line is that point where a “water rationing” plan is initiated to help insure water supplies last longer during a shortage. By lowering the line by six inches, we delay rationing. If a water shortage really is looming, it seems more prudent to start rationing sooner, rather than later. For this reason, we oppose lowering the line.

The claim that lowering the Supply Side Management Line by six inches will create “littoral zone benefits” seems overstated. A large, periodic **drawdown** in the littoral zone, that dries large areas of marsh, is beneficial. At 12 feet, 73% of the marsh is exposed as dry land (Minimum Flows and Levels Document, SFWMD August 11, 2000). Lowering the Lake below this level dries a little more area, but also creates a larger “refill” deficit. The tradeoff between drying more of the marsh (benefit), and making the Lake so low it takes a longer time for the marsh to reflood (harm), indicates lowering the Supply Side Management may add benefit in some rainfall scenarios, but create harm in others. Similar to our above comments on the WCA’s, a strategy for recovering the Lake from low water should be included.

#### **Option #8. Cancel BMP Makeup Water Deliveries During Droughts**

The duration of the proposed action is not specified in the draft document. Although this option might provide a short-term water supply benefit, we have concerns that adverse environmental impacts will occur in the Everglades, exacerbated by increased water



withholdings during drought periods. By increasing the volume of water withheld in Lake Okeechobee during droughts, the Everglades is being subjected to an unequal and increased level of adversity during periods of drought. Although we are not completely opposed to this option being implemented for the current drought, we are concerned that this option sets a poor precedent during a time when we are attempting to offset impacts to the Everglades that were caused by demands for flood control and water supply.

#### **Option #22. Lake Okeechobee Stormwater Back Pumping for Water Supply**

This practice was eliminated in 1979 because it was harmful. We strongly oppose resuming this practice because:

- 1) Backpumping would load the Lake with pollution. Water from S-2 and S-3 in 1999 averaged more than 250 parts per billion phosphorus. At this concentration, the proposed 100,000-300,000 acre-feet of water, would add 30 to 90 tons of P to the Lake. Considering the TMDL committee, recently convened by DEP, calculated that only about 135 tons of P should flow into the Lake annually, the proposed inflows and associated nutrient loads are much too large. Water quality now may be worse than noted above because canals are relatively low and the bottom-muck can be scoured by water flow, creating extra turbidity problems. EAA water has many other nutrient and chemical concerns including but not limited to, nitrogen compounds, chlorides, pesticides and herbicides, threatening myriad water quality violations (state and federal).
- 2) Backpumping for water supply could harm the Lake's recovery from this year's drawdown. Under the Shared Adversity Plan, the St. Lucie Estuary and Caloosahatchee Estuaries endured considerable impacts from fresh water. It would be unfortunate to reverse the recovery we have seen in Lake thus far. The P-laden water would be concentrated on the south end of the Lake and if accompanied by turbidity, would kill, or at least retard, the recovery of the submerged aquatic plants. Lewis Hornung's September 13 presentation to the Governing Board noted that 23 of 42 submerged-plant monitoring sites have plants growing; 40% (9 of these 23) are in the direct path of back-pumped water (see the map of submerged plant monitoring at (<http://www.sfwmd.gov/news/lorecess/august2000.jpg>)). If turbidity is low, we run the risk of large algae blooms with attendant water quality problems and possible fish and wildlife kills.
- 3) Backpumping could cost as much as 3.5 million dollars and is a relatively inefficient way to increase water supply. Most of this water would evaporate from the Lake before it is re-used (e.g., the 300,000 potential acre feet of water is slightly larger than an estimated May evaporation rate of 236,000 acre feet-- Lake Okeechobee Supply Side Management Plan by C. A. Hall, SFWMD, 1991). The cost to benefit ratio is questionable.
- 4) Backpumping constitutes a human health hazard for communities using the Lake for drinking water. The towns of South Bay and Pahokee do not have the water treatment capabilities to protect their citizens from cancer-causing trihalomethanes (Palm Beach Post, Bob King, 8-8-00). Trihalomethanes are created when using chlorine to treat water that contains large amounts of organic material-such as carried in backpumped water. These communities already have water that violates clean-water standards for trihalomethanes. Backpumping would exacerbate this.

- 5) To be most effective, backpumping needs to be implemented during the wet season. This is before we will know if a large water shortage potential exists. Considering the problems experienced with backpumping, backpumping seems an unjustifiable risk.

**Option #24. Capacity to Pump Water out of Lake Okeechobee at Low Lake Stages.**

This option would draw Lake Okeechobee even lower. The Water Resource Impacts section contains no mention of increased oxidation of organic soils in the south end of the Lake. Considering the extremely long periods it takes to form organic soils and the rapidity with which they can oxidize, or burn, this problem should be scrutinized. Another consideration that should be addressed is extra "refill" time this would cause for the Lake. One-year drying of the littoral zones can be healthy for the biotic resources of the Lake, but multi-year drying of the littoral areas can create multi-year loss of a huge area of wetland habitat (>100,000 acres) for wetland wildlife. We need a "recovery strategy" for this scenario, including impacts on the Federally Endangered Snail Kite. The final question about these pumps is: if taxpayer money is used to install and operate special pumps, is the benefit returning to the tax payers at large, or is a disproportionate amount of the benefit going to private individuals for irrigation of their crops?

Once again, we thank you for the opportunity to provide input to this process, and look forward to working with the South Florida Water Management District and other interested parties toward sustainable solutions to the problems before us. If you have questions regarding this letter, please contact Dr. Paul Gray at (863) 467-8497 or Shawn Komlos at (305) 371-6399 for clarification.

Sincerely,



Shawn Komlos  
Staff Scientist

cc: Richard Harvey ▪ USEPA  
Mark Musaus ▪ USFWS  
John Mitnik ▪ FDEP



# United States Department of the Interior

## OFFICE OF THE SOLICITOR

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SEP 20 2000

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September 15, 2000

Dean Powell, Deputy Director  
Water Supply Division  
South Florida Water Management District  
3301 Gun Club Road  
West Palm Beach, FL 33406

Re: Draft Water Supply Contingency Plan (August 25, 2000)

Dear Mr. Powell:

This letter constitutes the presently available comments of the U.S. Department of the Interior, National Park Service, and the U. S. Fish and Wildlife Service on the Draft Water Supply Contingency Plan dated August 25, 2000, and presented to the Lower East Coast Regional Water Supply Advisory Committee on September 7, 2000. We commend your staff for their originality and hard work in planning for possible water shortages in the coming dry season.

We have some concerns about parts of some of the draft contingency plan. Generally, the U.S. Fish and Wildlife Service (FWS) is concerned about the possibility of alteration of important habitat features that might change the feeding, breeding, or sheltering behaviors of endangered or threatened species. The National Park Service is concerned about maintaining the health and viability of both Everglades and Biscayne National Parks. In general the options for addressing water supply impacts in the northern end of the system are well represented. There is however less detail presented about the lower end of the system particularly Service Area 3 covering Everglades National Park and Biscayne National Park. The means to address water supply concerns and reduce water shortage rely heavily on the removal of water from the natural system particularly the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) as well as Everglades and Biscayne National Parks. There is in general a lack of information in this document on the projected impacts to the natural systems, including the Water Conservation Areas.

We believe this plan should be consistent with the proposed implementation of the Lower East Coast Regional Water Supply Plan, May 2000. We would like the District to further analyze the impact of this plan on the Refuge, Everglades National Park and the Water Conservation Areas in the context of Minimum Flows and Levels and the levels of impact of harm, significant harm, and serious harm. What level of harm are the proposed actions going to cause to these areas? What level of drought are we in currently and what level may be possible? How do these proposed action compare to those modeled and proposed by the Lower East Coast Regional Water Supply Plan (LECRWSP)? How do these proposed actions compare to those described in the LECRWSP? The Department of Interior is very concerned with the proposed idea to allow the Lake Okeechobee levels to fall to 9.5 or 9.0 feet by June 2001. That would make it impossible to send water to the south, and in the event of another dry year, it would be impossible to make up such a deficit. More realistic reductions of water use should be implemented prior to such extreme actions involving the natural areas.

Furthermore, the SFWMD should investigate estuarine effects in the lower west coast resulting from water shortages. The SFWMD should form a team including concerned governmental agencies and the public to develop a plan to ensure that estuarine areas receive minimum flows needed to sustain their resources during droughts.

Attached are specific comments on this plan. We suggest that SFWMD staff confer with FWS and National Park Service (NPS) staff to avoid such alterations of habitat beyond that which would naturally occur as a result of antecedent weather conditions. Please add FWS and NPS staff to the team developing water supply contingency plan information so that hydrological and ecological needs of the natural system are adequately represented.

Thank you for the opportunity to comment on the draft water supply contingency plan. The Interior Department may submit other comments when further information or analysis becomes available. The short period of time between our receipt of the draft rules and the comment deadline precludes any assurance that this letter could raise every point of concern or praise.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard H. McNeer".

Richard H. McNeer, Attorney

CC: Frank Finch, Executive Dir., SFWMD  
Pat Gleason, Chair, LECRWSP Committee  
John Fumero, General Counsel, SFWMD

Larry Belli, Dep. Supt. EVER

Stephen Forsythe, State Supervisor, FWS

Mark Musaus, Manager, A.R.M. Lox. NWR

John Donahue, Supt. BICY

Linda Canzanelli, Supt. BISC

Louis Hinds III, Manager, J.N. Ding Darling NWR

Jim Krakowski, Manager, Fla. Panther NWR

September 15, 2000

Comments of the National Park Service (NPS) and the U.S. Fish & Wildlife Service (FWS) to the SFWMD's Water Supply Contingency Plan (August 25, 2000)

**Option #1**     Move Water from WCA-1 Storage to Lake Okeechobee.

The discussion of the option in "Attachment I - Descriptions of Proposed Water Supply Options" indicates that water would be removed from WCA-1 only in compliance with the current regulation schedule adopted by the U.S. Army Corps of Engineers.

- a.     The U.S. Department of the Interior is concerned about the total volume of withdrawals from the north end of WCA- 1, the timing and rate of change of levels and flows within the Refuge, and the duration of such changes. The FWS appreciates the commitment of the SFWMD to work cooperatively with the management of the Refuge to avoid harm to the Refuge's ecosystem.
- b.     The SFWMD's draft attachment seeks support for Option #1 in supposed benefits "to the Cape Sable Seaside Sparrow and tree island habitat in the southern portions of WCA-3A." As explained elsewhere in this letter, the sparrow's recovery provides no support for any element of the draft water supply contingency plan.
- c.     Unless the SFWMD has evidence in the record that water levels in WCA-3A are presently too high for the health of tree islands, the plight of those tree islands fails to support Option #1 . In a prolonged drought, drowning tree islands will not likely be a problem. It is at least as likely, if not more likely, that wildfires will damage tree islands during an extended dry period. Therefore, concern for the stressed and diminishing tree islands of WCA-3A could weigh against implementing Option # 1.
- d.     We request an analysis of the likelihood that operation of the system as proposed will cause harm, significant harm, or serious harm to Water Conservation Area 1.
- e.     What would the impacts be to the Refuge and the ability to move water south through the system under this option if the drought continues? The FWS cannot support a plan that would withdraw water from both the north and south ends simultaneously.
- f.     The wording in the Water Resources Impacts section implies that there is a danger of high water impacts to the refuge. This should be amended to reflect that impacts to the Refuge would occur from low water not high water.
- g.     Has an analysis been done to support the statement under "conclusions" that "The Benefits of this option are highly dependent on developing hydrologic, environmental and climatological conditions.?"

- h. Change the last bullet under the conclusions section to reflect that there is a danger of low water impacts not high water impacts to WCA-1.

**Option #2**     Allow Deviation from the Water Conservation Area 1 Schedule.

- a. Based on the information in Draft Attachment I, the Interior Department would be likely to object to any petition to the Corps to allow reductions in minimum water levels in WCA-1 to meet water supply needs. That objection would be based on deliberate violations of minimum flows and levels (MFLs), prior to entering a phase III drought, and without cutbacks by consumptive users concurrent with a phase III drought. Such an action would cast doubt on the willingness and ability of the SFWMD to enforce and to maintain MFLs anywhere in the remaining natural system.
- b. Pursuant to the settlement agreement entered in Lake Worth Drainage District v. Caldera, No. 98-5857 (1<sup>st</sup> Cir. 2000), that drainage district may only petition the Corps for an emergency deviation from the WCA-1 regulation schedule if the WCA-1 stage is below 14 feet NGVD; the SFWMD Lake Okeechobee Supply Side Management water supply cutbacks are in effect; and a water shortage has been declared by the SFWMD for the WCA-1 service area. Although the SFWMD was not a party to that appeal, the Interior Department would strongly object to any petition for deviation before each of those prerequisites is fulfilled.
- c. The FWS would object to continued or repeated use of such emergency deviations for water supply purposes. Such routine use of emergency deviations would be contrary to law.
- d. The “Water Use Benefits” section under Option #2 in the Draft Attachment states that “[e]xcess water that may become available in WCA-1 this wet season, may be used to . . . meet supplemental irrigation demands in the early dry season. . . .” That may not be true in Service Area 3 (SA-3); on the contrary, Option #2 may increase severity of water shortage problems in SA-3 for both the natural system and the consumptive users.
- e. A ‘water use impacts’ section should be added to reflect the adverse effects of Option #2 on water levels and flows in WCA’s 2 and 3 and SA-3.
- f. We do not agree with the conclusion that this option will reduce the incidence and severity of water shortage declarations in the entire LEC. That conclusion should reflect the potential for decreased water availability in Service Area 3.

**Option #3**     Investigate Feasibility of Using Temporary Pumps and Structures.

We generally support this option, depending on how it is implemented. We suggest developing a plan to utilize temporary pumps in Service Area 3 to move storm water into areas where it can provide groundwater recharge to prevent flooding rather than dumping it during a drought.

- a. Identify areas that may serve as recharge areas during synoptic high rainfall storm events during drought.
- b. Identify means to route water to these areas to prevent flooding and provide recharge.

**Option #6**     Cloud Seeding

We do not believe enough information has been provided on the possible environmental impacts of this technology and it needs extensive investigation and analysis prior to being seriously considered.

**Option #7**     Develop and Implement a Modified Supply Side Management Plan

We are concerned that lowering the supply-side management (SSM) line will ultimately result in the inability to make deliveries to Service Area 3. The impact of lowering the SSM line on the natural areas will be compounded by the proposed movement of potable consumptive use withdrawals to the west.

- a. The impacts of this option on the National Parks and other natural areas must be clearly identified and evaluated.
- b. We believe that this may limit the ability to move water to the southern portion of the system (SA-3) and will negatively impact the National Parks.
- c. The impacts of this option cannot be considered separately from the suggestion to shift wellfield pumping in Miami-Dade County to the west.

**Option #8.**     Cancel BMP Makeup Water Deliveries during Droughts.

- a. Providing BMP makeup water is a requirement of the consent decree entered in United States v. South Florida Water Management District, No. 88-1886 CIV-Hoeveler, para. 9 (S.D. Fla. 1992), and of the proposed modified consent decree pending before the court. The SFWMD must consult with the federal plaintiffs and their counsel from the U.S. Department of Justice before suspending BMP makeup water deliveries.
- c. This letter does not include comments supporting or opposing suspension of deliveries of BMP makeup water in certain circumstances. It is important, though, that the SFWMD experts meet with staff of the National Park Service



(NPS) and of the FWS to review the need for, and the consequences of, Option #8.

- d. The Draft Attachment I to the Draft Water Supply Contingency Plan at pI-13 states that Option #8 has “potential to help alleviate high water levels in Water Conservation Areas resulting from actions related to the Cape Sable seaside sparrow biological opinion.” The biological opinion pertaining to the Cape Sable seaside sparrow provides no support for Option #8. The breeding season for the sparrow is over for this year and it is unlikely that high water will be a problem in the existing drought situation facing the district. The next breeding season will not start until February or March of 2001. Thus, the sparrow is not an issue in the beginning of the dry season (i.e., the next few months). Indeed the potential to impact the sparrow may come from allowing the eastern side of the Park to become unnaturally dry and therefore subject to severe fires or growth of shrubby vegetation that would negatively impact the eastern sparrow habitat. In a drought extending into the next breeding season, high water levels in the WCA’s will not be a problem to be “alleviated.”

**Option #9**     Modify Water Levels that are Used to Trigger Water Restrictions

- a. We request that the following be added to the list of implementation components: Work with NPS and FWS biologists and hydrologists to develop triggers which protect wildlife and habitat to the maximum extent possible including MFLs and preventing harm, serious harm, and significant harm.
- b. It is essential for representatives of the NPS and FWS to be included as members of any Water Shortage Team convened by the District.
- c. Water shortage triggers should include preventing harm or significant harm to the natural areas. This component should be included as an implementation of the Lower East Coast Regional Water Supply Plan as supplement to the MFL process and the Water Reservations to the Natural Systems process.
- d. The District identifies the benefit of this option as preventing serious harm to water resources. However, the benefit described is limited to preventing damage to the aquifer in the form of saltwater intrusion. The proposed option does not mention damage to the environment, the impacts on proposed MFLs for the WCA’s and Everglades National Park, or the impact to Biscayne National Park.
- e. No water resource impact is identified for this option, yet it is likely that one or both National Parks will experience significant or serious harm under this drought.
- f. We request that the District address how the proposed triggers address the procedures agreed upon in the LEC plan to address the natural areas. Proposed

triggers must include harm, significant harm, and serious harm for the environment.

- g. Adverse ecological effects on the natural system components must be addressed before implementing Option #9.

**Option #10**    Expand Water Shortage WEB Page

We support this option and request that more information on the environment be added.

**Option #11**    Reduce Maintenance Levels in LEC Coastal Canals.

The Draft Attachment I states that lower canal stages would result in saltwater intrusion, requiring “shifting of wellfield pumpage to the west.” A. p.I- 15.

- a.     The Interior Department strongly objects to new wells or increased pumpage that would withdraw water from beneath Everglades National Park, resulting in lower surface or groundwater levels than would have occurred naturally or without the pumping. The NPS is concerned that this supersedes the process described by the LECRWSP and continues to remove water from the natural system without regard to minimum flow and level criteria or severe harm. The NPS is waiving no legal right or remedy that could be exercised to prevent and abate such destruction or removal of National Park resources.
- b.     The Interior Department objects to new or increased withdrawals that would take water from water conservation area 3 (WCA-3) that would otherwise flow into Everglades National Park to maintain or to restore the Park’s ecosystem. This is especially important in an area already impacted by failure to meet minimum flow and level criteria.
- c.     Moreover, the Interior Department is concerned that the effects on the ecosystem of Biscayne National Park be analyzed and compared to natural effects of droughts before canal stages are lowered.

**Option # 20**    Water Conservation Projects-Landscape Irrigation Retrofit and Education

We support the recommendations under this option. We also recommend that SFWMD develop similar water conservation projects for agricultural irrigation, particularly in the lower west coast region.

**Option # 21**    Water Conservation Projects-Year Round Landscape Irrigation Guidelines.

See comments to option #20.

**Option #22**     Lake Okeechobee Stormwater Back Pumping for Water Supply

As acknowledged in the draft plan, back pumping from the EAA canals into Lake Okeechobee would degrade water quality, cause blooms of algae, and adversely affect submerged aquatic vegetation (SAV) and thus the ecological health of the lake. Those adverse effects would come after the SFWMD has taken great pains to help SAV recover by lowering water levels. Option #22 should be considered only as a last resort, and only after careful consideration of the ecological ramifications, and after review by the FDEP for water quality concerns.

**Option #23**     Use Pumps at S-2 and S-3 in Reverse Direction

Pumping water out of Lake Okeechobee for water supply purposes when the water levels in the lake are near 10 feet NGVD or less would violate the minimum flows and levels of 11 feet NGVD proposed for the lake. It would also cause ecological damages to the littoral zone and fisheries of the lake. The Interior Department cannot support that option until the consequences of such operations are fully understood.

**Option #24**     Capacity to Pump Water out of Lake Okeechobee at Low Lake Stages

See comments to option #23.